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Final Abstract:

The research conducted will address the effective use of modeling instruction and application in the Physics 2 classroom, specifically the teaching of Optics, which include the properties of light, reflection, refraction, lenses and interference. To further clarify, models are sets of representations such as graphs, pictures, diagrams, equations and/ or written explanations, which are interconnected and used to explain a physics phenomenon. By teaching the effective use of these models, we hope students are able to explaining, predicting and describing characteristics of optics phenomena. This project will be broken down into two sections: curriculum development and curriculum evaluation. Curriculum development addresses how optics will be taught in the Modeling Instruction (MI) class, including homework, classwork and lab design, as well as class discussions. All curriculum materials will be proofread by supervisors and peers, and redesigned or changed as needed. In order to evaluate the effectiveness of the curriculum, student understanding will be assessed through a pre/post class survey with questions about optics to see how the students have consolidated the material and scans of graded labs and exams to see how well students put models into effect. Observations will be held in the MI classroom during the teaching of optics to see student engagement and interaction with the material. Although Florida International University (FIU) already has MI classes, there are certain physics topics not currently covered, including my current research in optics. By designing these classroom materials, FIU's MI will acquire a new part to its curriculum, optics.